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## **Creating good feelings about unhealthy food: children's televised 'advertised diet' on the island of Ireland, in a climate of regulation**

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Childhood eating habits and associations with advertising persist through life. Obesity is high in Ireland, and is increasing worldwide. Links between food promotion and children's diets are well-established, and the World Health Organisation has called for reduced marketing of foods high in fat, sugar and salt (HFSS) to children. In Ireland and the UK, statutory regulation restricts HFSS television advertising, but only during children's programming – yet children view much television at other times. This study is the first to identify young children's exposure to television food advertising on the island of Ireland (Iol), and its nature, with systematic sampling according to Irish audience panel research. Food advertisements were nutrient profiled and content analyses were conducted of marketing techniques. The Iol 'advertised diet' viewed by young children primarily features dairy and fast foods, pizza, sweets and chocolate, normalising this consumption and associating it with taste/aroma, fun, magic/ imagination, physical activity, humour and exaggerated pleasure. HFSS ads primarily featured taste/aroma, humour and novelty. Despite complying with statutory regulations, more than half of Iol food advertisements featured HFSS items; young children see over 1000 HFSS ads annually in the Republic of Ireland, nearly 700 in Northern Ireland. Policy implications for remedying children's HFSS ad exposure include (i) applying food advertising restrictions to times when higher proportions of young children watch television – not just child-directed programming – as well as to digital media, (ii) employing a stricter nutrient profiling method and (iii) normalising children's 'advertised diet' by exploring ways to advertise healthy foods.

**Keywords:** pre-school children; television advertising; nutrient profiling; persuasive techniques; food; Ireland

Ireland has high childhood obesity rates, with 1 in 4 children overweight or obese across the island of Ireland (IoI), according to SafeFood, the Food Safety Authority for the IoI (SafeFood, 2013). In the context of rising rates of obesity worldwide, the World Health Assembly (WHA, 2010) and the World Health Organisation Commission for Ending Childhood Obesity (WHO, 2016) have called for countries to reduce children's exposure to the marketing of foods and beverages high in saturated fats, trans-fatty acids, free sugars or salt (henceforth, HFSS foods). Despite growth of digital media, children continue to watch substantial amounts of television, with new media viewing practices adding to, rather than substituting for, television viewing (Landon, 2013; Ofcom, 2015). Children's 'advertised diet' on television – the food advertising they view – has been skewed for decades towards HFSS foods (Boyland, Harrold, Kirkham, & Halford, 2011; Harris, Sarda, Schwartz, & Brownell, 2013; Kelly et al., 2010).

The development of food preferences, choices and habits is a highly complex, multi-factorial bio-psycho-social process that takes place over time in micro- and macro-contexts, involving, for example, taste, emotion, memory, family or peers, and culture (see the Life Course Model for food choice processes, Sobal, Bisogni, Devine, & Jastran, 2006). Research into how exactly children's eating is shaped is still underdeveloped (Jansen, Daniels, & Nicholson, 2012), but parent behaviours, such as modelling of eating behaviours and the food they give their young children, are known to have a significant impact (Skouteris, 2012; Slusser et al., 2012). Socio-economic status is one of the stronger predictors of poorer eating habits and greater overweight/obesity in children in Australia, Europe, the USA and elsewhere (Cameron et al., 2012; Craig, McNeill, Macdiarmid, Masson, & Holmes, 2010; James, Leach, Kalamara, & Shayeghi, 2001; Moschonis et al., 2010). Furthermore, Nyberg, Sundblom, Norman, and Elinder (2011) have proposed a conceptual model where family socio-economic status is mediated by parent and classroom factors, to affect children's food knowledge, attitude and preferences, which in turn influence children's diet.

Despite the many complex, inter-related factors determining children's overweight and obesity, systematic reviews for the World Health Organisation and the US Institutes of Medicine have also consistently identified HFSS advertising as a factor in the early development of children's food preferences, choices, eating habits and hence obesity (Cairns, Angus, & Hastings, 2009; Cairns, Angus, Hastings, & Caraher, 2013; McGinnis, Goolman, & Kraak, 2006). Early eating practices form lifelong habits (Alles-White & Welch,

1985) and, long before children can make their own purchases, they influence family food choices (Nørgaard, Bruns, Christensen, & Mikkelsen, 2007). Positive emotions associated with food brands advertised in childhood last into adulthood, even among adults whose knowledge of healthy eating motivates them to resist (Connell, Brucks, & Nielsen, 2014).

The pre-school years are a formative period when habits leading to obesity in childhood and later become established. Targeting pre-school-aged children is therefore critical, as risk factors for becoming overweight can be modified more easily than in later childhood or adolescence (Skouteris, 2012). The necessity of doing so in Ireland is highlighted by studies on the Iol with young children (aged 3–5 years) demonstrating that they have high levels of food brand knowledge, particularly for HFSS brands (Tatlow-Golden, Hennessy, Hollywood, & Dean, 2014). The young children recognised up to three times as many HFSS food brand logos, compared to logos for healthier items (even though healthier brands shown were advertised on television at similar rates as the HFSS brands). Children's knowledge of unhealthy food brands increased significantly between 3 and 4 years – before their understanding of the concept of healthy food began to increase, at 5 years (Tatlow-Golden, Hennessy, Hollywood, & Dean, 2013), and earlier than brand knowledge develops for non-food items in young children (Valkenburg & Buijzen, 2005).

Although observational and experimental studies have consistently demonstrated that children's food choices, and the amounts they eat, are affected by exposure to advertising, theory in this area is underdeveloped (Folkvord, Anschütz, Boyland, Kelly, & Buijzen, 2016). Previously, theories of advertising literacy, drawing on Piagetian cognitive developmental stages, concluded that from early adolescence, young people could readily defend against advertising. Such models are increasingly being questioned, as defending against advertising requires more than simply recognising it and understanding its persuasive intent (see, e.g. Harris, Brownell, & Bargh, 2009; Rozendaal, Lapierre, van Reijmersdal, & Buijzen, 2011). However, the vulnerability of younger children to advertising, and their need for protection from it, is not generally disputed. Folkvord et al. (2016) proposed a Reactivity to Embedded Food Cues in Advertising Model, to map the way in which food advertising exposure combines with children's susceptibility (e.g. attention, impulsivity) and their integration of food messages, to affect their reactivity. Where children process persuasive messages using less cognitive elaboration, such as in earlier childhood, they are more vulnerable to

advertising effects (see Buijzen, Van Reijmersdal & Owen's model regarding processing of commercialised media content, 2010).

Statutory regulation or voluntary policies restricting television food advertising to children now exist in over 20 countries (Galbraith-Emami & Lobstein, 2013). Although these aim to reduce children's exposure to food marketing, they typically apply to child-directed programming only, despite the fact that children also watch family/general entertainment and sports, where HFSS advertising is high (Boyland & Halford, 2013; Galbraith-Emami & Lobstein, 2013; Harris et al., 2013). In England, for example, after statutory regulation was introduced, HFSS advertising around children's programming fell to nearly zero, but it more than doubled at non-restricted times when children viewed TV, from 1.4m HFSS advertisement spots in Q1 2005 to 3.2 m in 2009 (Galbraith-Emami & Lobstein, 2013).

If effective interventions addressing food advertising and eating patterns are to be devised, the extent of advertising to children and its nature need to be understood. Although this issue has been extensively explored in other jurisdictions, in Ireland, the extent and nature of food advertising to which children are exposed is almost completely undocumented. Although a recent study made a first foray (Scully et al., 2015), its data were drawn from 2010, before regulations were mooted for the Republic of Ireland (RoI) (BAI, 2012a). Furthermore, its findings are limited by the fact that its sampling did not reflect children's viewing patterns, as it sampled from just one channel, on only five weekdays, before 5 pm. Nor did it employ a standardised system for identifying the healthy/unhealthy status of advertised foods (Scully et al., 2015). Therefore, the current 'advertised diet' seen on television by children in Ireland remains to be specified.

As part of a wider study examining pre-schoolers and food marketing on the IoI, this study therefore aimed to identify (i) the extent and HFSS nature of young children's 'advertised diet' on the IoI, by employing systematic sampling from times when high proportions of young children (4–6 years) view television, and systematic nutritional categorisations of foods as healthy/less healthy; (ii) differences in HFSS food advertising between the two jurisdictions on the IoI and (iii) persuasive techniques employed by advertisers to promote HFSS and healthier foods at times and on channels when data indicate young children are most likely to be viewing.

## Method

As this study involved analysis of broadcast material in the public domain it was declared exempt from ethical review at participating universities.

### Sample

Advertising was sampled from both jurisdictions on the Iol: the RoI and Northern Ireland (NI; part of the UK). These have similar eating practices (Irish Universities Nutrition Alliance, 2001) and share many television channels (Broadcasting Authority of Ireland [BAI], 2012b), but do not have identical television advertising, even on shared television channels, under opt-out arrangements (BAI, personal communication, 30 July 2013). They have similar statutory regulations regarding HFSS advertising to children (BAI, 2013a), which apply to children's programming up to 6 pm, defined under BAI rules as under-18s forming 50% of the audience (BAI, 2013b), and under Ofcom as 'in or around programmes that are likely to be of particular appeal to children aged 4–15 years', defined as those where the proportion of viewers under 16 years is at least 20% higher than the proportion of children in this age group in the general population (Boyland et al., 2011).

To assess pre-schoolers' most likely food advertising exposure, we sampled from channels and times that have the highest viewership among young children. Nielsen/ TAM Ireland-Arianna audience panel data, provided by the BAI, identified (i) the RoI TV channels that children (4–6 years) viewed most. In descending order, these were: RTE2 (children's programmes in daytime, general programmes in the evening); RTE1; TV3 (general programmes); Nick Junior; Nickelodeon (dedicated children's channels) and (ii) times of greatest viewership among young children (see Table 1). UK viewing patterns are similar (Ofcom, 2011), and therefore five similar NI channels were selected: UTV, RTE2, Channel 4, Nickelodeon and Nick Junior (excluding BBC channels, which do not advertise). Data were collected over five consecutive weeks from Monday 8th October to Sunday 11th November 2012; recordings totalled 210 hours and the sampling frame is presented in Table 1.

Table 1. Sampling frame for channels and times recorded on the Island of Ireland.

	Channel	Monday	Thursday	Saturday	Sunday
Time		15.30–20.59	15.30–20.59	09.30–10.59 18.30–21.59	09.30–10.59 18.30–21.59
ROI	RTE 1	8 October	11 October	13 October	14 October
NI	UTV				
ROI	TV3	15 October	18 October	20 October	21 October
NI	Ch4				
ROI	Nick Junior	22 October	25 October	27 October	28 October
NI	Nick Junior				
ROI	Nickelodeon	29 October	1 November	3 November	4 November
NI	Nickelodeon				
ROI	RTE 2	5 November	8 November	10 November	11 November
NI	RTE 2				

## Analysis

Reviewers in ROI and NI logged all TV advertisements, noting every instance of food advertising including sponsorship 'spots' to capture the full range of exposure. In line with previous studies (e.g. Hebden, King, & Kelly, 2011; Kelly et al., 2007), the following items were excluded: alcohol; tea, coffee; formula milk; baby/toddler foods; weight loss/gain products and generic supermarket advertisements. When only a logo was shown, the brand's 'signature' product was coded; for example, Special K® logos were coded as Special K® cereal.

*Nutritional analysis (1):* UK Nutrient Profiling (UK NP). As UK NP (Department of Health, UK, 2011) is the system that has guided UK statutory HFSS regulation since 2007 (including in NI), and in an adapted form in ROI in mid-2013 (BAI, 2013a), it was the first system applied to assess whether foods were 'healthy' or 'less healthy'. First, the target advertised food in the ad was identified (ancillary items were not coded). Second, nutritional data were sourced from product/supermarket websites, product labels, manufacturers, or McCance and Widdowson UK food composition databases (FSA, 2002). Third, UK NP was applied and was cross-checked by three researchers including an independent nutritionist.

*Nutritional analysis (2):* Comparison of UK NP analysis with the WHO-European Region Nutrient Profile Model (WHO-Euro NP). UK NP is based on negative and positive nutrients and food components, and has been well validated (Arambepola, Scarborough, & Rayner, 2008). However, it identifies fewer foods as 'less healthy' than other major profiling systems

(Scarborough et al., 2013). For example, it permits marketing to children of foods that would not pass the recommendations for marketing to children made in the WHO Europe Nutrient Profile Model (WHO, 2015), for example, those with more than 10 g sugar per 100 g, or drinks with artificial sweeteners. When applied to a dataset of food ads, UK NP permitted 47% ads to be broadcast to children, more than all seven other models used in the comparison, from Brazil (44% food ads permitted), Denmark (33%), the EU Pledge (32%), the US Center for Science in the Public Interest model (22%), US Interagency (14%), PepsiCo (14%) and Disney (2%) (Scarborough et al., 2013).

Therefore, the UK NP analysis was compared to a second NP analysis, the WHO Regional Office for Europe Nutrient Profile Model (WHO, 2015). Adopted in 2015, this NP model has gained rapid worldwide acceptance and has been adopted by all but one of the WHO's Regions (Nishida, 2016).

*Nutritional analysis (3):* Food groups analysis. To identify which types of foods were advertised most frequently, 13 food categories were created (Table 3) through consultation with university nutrition experts on the research team and the literature (e.g. Adams, Simpson, & White, 2011). In line with the approach taken in UK NP, as this guides the restriction of broadcast advertising in both NI and RoI, fast food restaurant advertisements were coded not for the brand advertised but for foods shown (e.g. if a McDonald's Happy Meal® ad showed carrot sticks, this was coded as fruit/ vegetable; if it showed a burger, this was coded within burgers/pizzas).

*Nutritional analysis (4):* Comparison of food groups with UK Eatwell Plate. Finally, the food categories analysis in (3) above was adapted to compare the foods in the 'advertised diet' with food group proportions recommended in the UK Food Standards Agency Eatwell Plate (Food Standards Agency, n.d.). The FSA recommends a healthy diet consist of 33% fruit and vegetables, 33% starchy foods, 15% dairy foods and milk, 12% meat, fish, eggs and beans and 7% foods high in fat and/or sugar. Sauces, condiments and some drinks that, due to their composition, did not fit clearly within an FSA Eatwell Plate category were designated Other (16%; n = 80) which included both UK NP 'healthy' and 'less healthy' items.

All advertised items classified as 'less healthy' by UK NP (including sweets, chocolate, fats, breakfast cereals, meat, fish, burgers, pizzas and drinks) were placed in High in fat and/or



sugar. A small number of burgers/ pizzas were categorised as 'healthy' by UK NP. To be able to code these within the Healthy Eating Plate food group categories, they were split evenly between the Meat and Starchy foods categories. Starchy foods included breads, potatoes, pasta, rice and 'healthy' breakfast cereals. Meat and other items included meat, fish and eggs. Cheese, yoghurts and milk were placed in the Dairy category, including higher fat items, as the Rol's UK NP adjustment allows for nutritional recommendations that young children consume dairy foods including cheese (BAI, 2013a). All fruit and vegetables, including those advertising fast food restaurants, were coded as Fruit and vegetables.

*Marketing techniques analysis.* Drawing primarily from Hebden et al. (2011) but also from other previous studies of food advertising (Chapman, Nicholas, & Supramaniam, 2006; Folta, Goldberg, Economos, Bell, & Meltzer, 2006; Lewis & Hill, 1998; Oates & Newman, 2010), advertisement formats (e.g. settings, characters ad features) and persuasive appeals (emotional and informational appeals used) were specified, and a complete codebook of 113 codes developed (76 marketing formats and 36 food-related; see Note 1 for a list of all 113 codes). Three coders conducted the analysis in the Rol and two in NI. To ensure consistency across coders, in the process of training, every 10th advertisement was selected for independent analysis throughout the dataset, and any differences arising were discussed and coding amended in light of these clarifications. No differences were identified that could not be resolved by discussion. Inter-rater analysis was later conducted by calculating the percentage agreement across coders for every code and then calculating the mean of these agreements. No code had an inter-rater agreement level lower than 85%. The percentage agreement for marketing techniques was 94.0% for ad format, 97.0% for characters and settings, 95.7% for persuasive appeals (overall, 95.6%), similar to the very high or perfect levels of agreement reported in studies of general and food advertising directed at children (Buijzen & Valkenburg, 2000; Hebden et al., 2011).

Frequencies of advertising techniques were calculated for the full sample and separately for healthy and unhealthy ads. Chi-square analyses ascertained whether any differences were statistically significant. As multiple analyses were conducted, to avoid Type 1 errors, a Bonferroni correction was applied and significance levels were set at  $p = .001$ .

## Results

Across the Iol, over 210 hours' programming, 7698 advertisements were recorded, 508 of which were for food and drink (6.6%). Of all advertisements in RoI, 8.4% were for food ( $n = 306$  of 3665), 5.0% ( $n = 202$  of 4033) in NI. There were substantial variations across channels in food advertising (Table 2): dedicated children's channels (Nickelodeon and Nick Junior) showed fewer than one food advertisement per hour whereas general commercial channels showed up to 5.8 food ads per hour in RoI (TV3), 3.7 per hour in NI (UTV).

Table 2 Food advertisements by jurisdiction, channel, and per hour of broadcast

Channel	RoI		NI	
	<i>n</i>	<i>per hour<sup>a</sup></i>	<i>n</i>	<i>per hour<sup>a</sup></i>
TV3	122	5.8	---	---
RTE1	84	4	---	---
RTE2	63	3	52	2.5
Nickelodeon	26	1.2	14	0.7
Nick Junior	11	0.5	14	0.7
Channel 4	---	---	45	2.1
UTV	---	---	77	3.7
<i>Total food advertisements</i>	<i>306</i>		<i>202</i>	
<i>Total advertisements</i>	<i>3665</i>		<i>4033</i>	

<sup>a</sup>21 hours per channel

## Nutritional analyses

*Nutritional analysis (1):* Nutrient profiling UK NP. This analysis identified just over half of ads in both jurisdictions as less healthy, 55.2% ( $n = 169$ ) in RoI and 53.5% ( $n = 108$ ) in NI; these did not differ significantly,  $\chi^2(1) = .153$ ,  $p = .382$ .

*Estimation of young children's annual 'advertised diet' according to UK NP:* Iol parents report pre-school children watch 2 hours and 9 minutes TV daily (Tatlow- Golden, Hennessy, Hollywood, & Dean, 2015). Per hour, 4.3 food ads were shown in RoI on general channels and 0.85 on children's channels; in NI 2.8 food ads were shown hourly on general channels and 0.7 on children's channels (Table 2). To estimate children's food ad exposure, we noted from audience panel research (see the Method section) that children view general TV more than children's channels. We thus made a conservative estimate and allotted one hour of children's viewing per day to general channels and one hour to children's channels. Young children's overall food advertising exposure in NI can thus be estimated at 3.5 advertisements per day or 1277 per year; for RoI the estimate is 5.15 food advertisements per day, 1880 per year. Finally, we applied the proportions of healthy and less healthy TV advertisements identified with the UK NP analysis (55.2% RoI; 53.5% NI). This yielded an estimate of young children's exposure to less healthy food advertisements of approximately

1037 advertisements per year in RoI, and 683 in NI (the lower figure for NI is due to lower food advertising overall).

As RoI and NI did not differ significantly in terms of proportions of healthy and unhealthy advertising, according to UK NP, the 508 food ads from across the IoI were combined for all subsequent analyses.

*Nutritional analysis (2):* WHO-European Region NP. Analysis of all 508 ads from both jurisdictions specified that 71.9% (n = 365) ads featured items that, according to WHO-Euro NP (WHO, 2015), are not permitted to be advertised to children, with just 28.1% permitted (n = 143).

*Nutritional analysis (3):* Food categories. With guidance of nutritionists on the research team, items were assigned to food categories (Table 3). Dairy foods were advertised most frequently; breakfast cereals and meat/fish advertisements showed twice as many unhealthy items as healthy items. Fast food brands were often advertised with healthy items, for example, 70% (n = 35) of McDonald's® advertisements featured carrot sticks, milk and further items coded as 'healthy' under UK NP. Notably, nearly 1 in 10 ads in this sample was for McDonald's® (n = 50 of 508).

Table 3: Food groups for all advertisements (RoI and NI combined)

	All ads (N = 508)		UK Nutrient Profile category			
			Healthy (n = 231)		Less healthy (n = 277)	
	%	n	%	n	%	n
Dairy	<b>23.6</b>	120	<b>35.9</b>	83	<b>13.4</b>	37
Fast food items (burgers, pizzas)	<b>12.8</b>	65	<b>11.3</b>	26	<b>14.1</b>	39
Sweets and chocolate	<b>11.4</b>	58	<b>0</b>	0	<b>20.9</b>	58
Drinks	<b>7.9</b>	40	<b>6.9</b>	16	<b>8.7</b>	24
Breakfast cereals	<b>7.9</b>	40	<b>5.2</b>	12	<b>10.1</b>	28
Meat, Fish, eggs	<b>7.3</b>	37	<b>4.8</b>	11	<b>9.4</b>	26
Desserts, cakes, savoury snacks	<b>6.9</b>	35	<b>0.4</b>	1	<b>12.3</b>	34
Soups	<b>6.1</b>	31	<b>13.4</b>	31	<b>0</b>	0
Fruit & vegetables	<b>5.3</b>	27	<b>11.7</b>	27	<b>0</b>	0
Fat spreads	<b>3.9</b>	20	<b>0</b>	0	<b>7.2</b>	20
Sauces, condiments, jams, spreads	<b>3.0</b>	15	<b>3.5</b>	8	<b>2.5</b>	7
Breads, pasta, rice, potatoes	<b>2.4</b>	12	<b>5.2</b>	12	<b>0</b>	0
Other	<b>1.6</b>	8	<b>1.7</b>	4	<b>1.4</b>	4

*Nutritional analysis (4):* Comparison of food groups with Eatwell Plate. Items were assigned to UK Food Safety Authority's Eatwell Plate groups. Compared to Eatwell Plate-recommended proportions, shown in bold (see Figure 1), foods advertised on the IoI were:

high fat and/or sugar 7% 53% (n = 230); Dairy 15% 27% (n = 120); meat and other items 12% 12% (n = 24); starchy foods 33% 8% (n = 37); fruit and vegetables 33% 6% (n = 27) and other items 16% (n = 80).

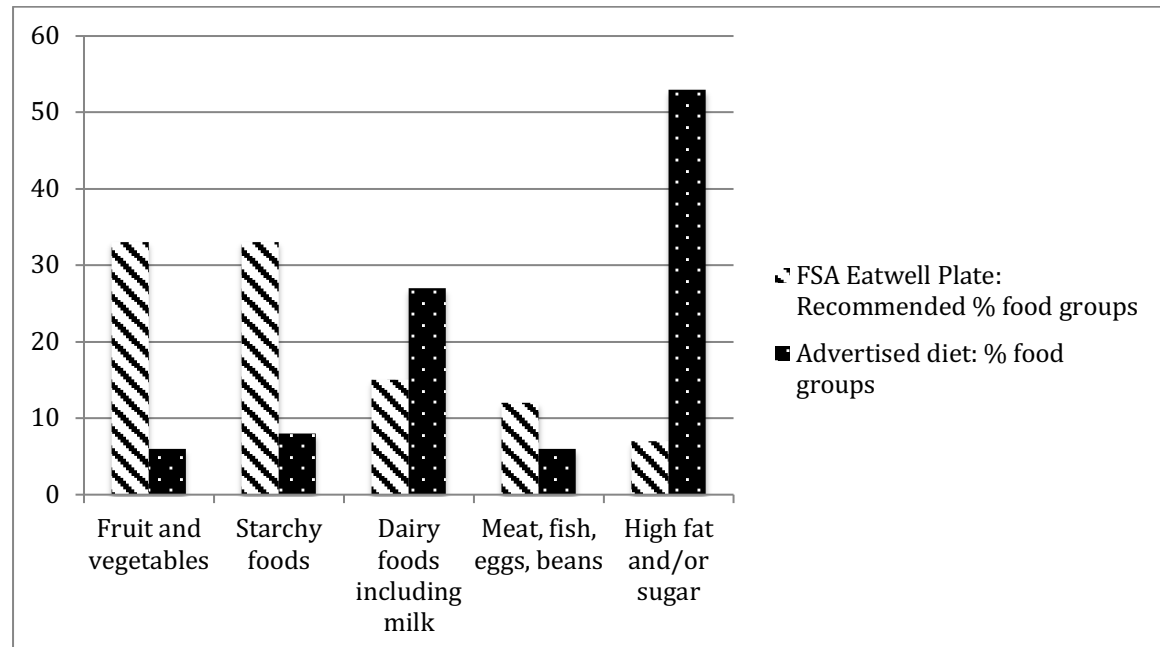


Figure 1: Recommended healthy diet proportions (UK Food Safety Authority's Eatwell Plate) compared with 'advertised diet' proportions, seen by young children on the Island of Ireland

### ***Analysis of marketing techniques***

In addition to nutritional analyses, the visual, audio and persuasive content of food ads was analysed.

*Settings, characters and visual features of ads.* The most frequent setting for food advertisements was in the kitchen or at a table in the home (over a quarter); 'green' settings such as parks or countryside were second (Table 4). Most ads featured adults; a quarter featured children or animated characters and 5% featured celebrities. Almost all ads showed the brand logo (98%) and stated/sang the brand name (93%). Most showed product packaging (83%) and had music or a jingle (79%).

*Persuasive appeals (emotional or informational).* The most frequent persuasive appeals across all healthy and less healthy food and drink advertisements were emotional appeals. Nearly half of ads referred to the taste or aroma of the product (Table 4). Fun, play, enjoyment was noted for a third of ads; magic, fantasy, imagination by a quarter and

physical/athletic ability by one in five. Regarding informational appeals, nearly one in five made a nutrition or health claim; referred to fast food or food being easy to obtain; or stated that the advertised item was special quality.

Table 4. The most frequently recorded marketing techniques used in food and drink advertisements shown across the Island of Ireland.

	Total Food Ads (n = 508)		Healthy (n = 231)		Less healthy (n = 277)	
	%	n	%	n	%	n
Direct audience address	80.3	408	87.1*	201	74.6	206
Music/jingles	79.1	402	80.6	186	77.9	216
Disclaimer on screen*	44.1	224	51.7*	119	37.7	104
Audio disclaimer	0.6	3	0	0	1.1	3
<b>Setting</b>						
Home - kitchen/eating*	29.5	150	37.1*	86	23.2	64
Park/ country	15.6	79	20.7	48	11.2	31
Fantasy*	14.6	74	21.6*	50	8.7	24
Home – garden*	10.4	53	19.8*	46	2.5	7
Home - living	9.1	46	5.2	12	12.3	34
Shop/retail*	8.7	44	2.6	6	13.8*	38
<b>Characters</b>						
Human	64.4	327	65.5	151	63.4	176
Animated	27.2	138	32.2	74	22.8	63
Child	26.6	135	31.0	72	22.8	63
Parent/child	15.9	81	14.7	34	17.0	47
Friends (incl adult friends)	14.2	72	15.5	36	13.0	36
Animal*	12.6	64	22.0*	51	4.7	13
Promotional characters*	8.1	41	18.7*	43	2.2	6
Celebrities	4.7	24	1.7	4	7.2	20
<b>Persuasive appeals, claims and offers</b>						
Taste, aroma*	45.7	232	34.5	80	55.1*	153
Fun (play, enjoyment)*	33.3	169	46.6*	108	22.1	62
Magic, fantasy, imagination*	23.2	118	32.3*	75	15.6	43
Physical/athletic activity*	21.1	107	36.2*	84	8.3	23
Nutrition/ health claim*	18.9	96	34.5*	80	5.8	16
Special quality	17.9	91	16.8	39	18.8	52
Novelty/innovative*	16.7	85	9.5	22	22.8*	63
Premium, offer, contest	15.4	78	18.5	43	12.7	35
Humour*	14.8	75	6.5	15	21.7*	60
Exaggerated pleasure	13.6	69	9.5	22	17.0	47
Satisfies hunger/thirst	11.0	56	13.8	32	8.7	24
Happy family	8.3	42	5.6	13	10.5	29
Economy/good value	8.3	42	9.1	21	7.6	21
Achievement	5.9	30	3.4	8	8.0	22
Gives energy	4.7	24	2.6	6	6.5	18

\* significant difference I chi-square analysis at p <.001

Further frequently used emotional or informational persuasive appeals (one in ten ads or more) were humour and exaggerated pleasure sensation; references to items as innovative, mention of an offer or contest or reference to satisfying hunger or thirst (Figure 2).

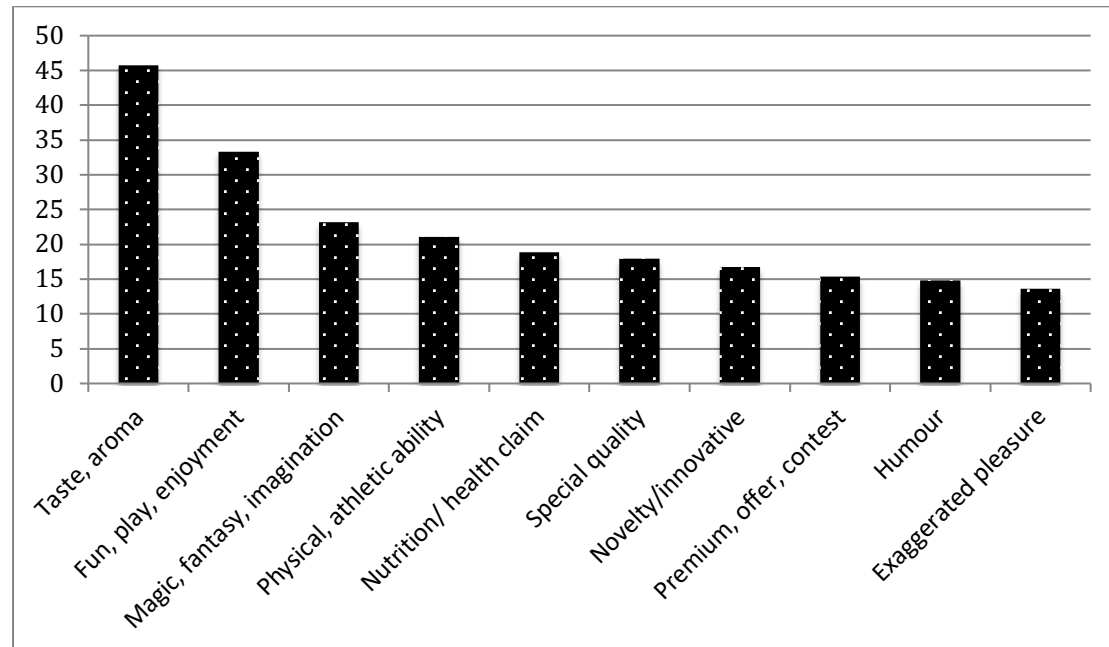


Figure 2: Percentages of 508 food ads using persuasive appeals (ads shown at times of high viewership among young children on the Island of Ireland)

Advertisements for UK NP healthy and less healthy foods differed in the patterns of persuasive appeals used. UK NP healthy foods most frequently used the persuasive appeal of fun/play (nearly half); and about a third of ads each featured physical/athletic activity; taste/aroma; nutrition/health claim or magic/fantasy. Compared to advertisements for unhealthy foods, ads for healthy foods referred significantly more to fun/play; magic, imagination; and physical activity, and were also significantly more likely to employ a nutrition/health claim, or to have disclaimers on screen. In contrast, UK NP less healthy foods most often used persuasive appeals of taste/aroma (over half); novelty; fun/play and humour (all nearly a quarter). Compared to advertisements for healthy foods, ads for less healthy foods significantly more frequently evoked taste/aroma, humour and novelty (Table 4).

## Discussion

In the context of widespread international concern about increases in child obesity, international agencies and organisations with remits addressing child well-being and health, such as the WHO and UNICEF, are calling for reductions in food promotion to children. This

continues to be an issue even in countries such as Ireland that have statutory restrictions on such advertising, as restrictions typically only apply to child-directed television programming. This study therefore aimed to go beyond children's programming and to explore the nature of food and drink television advertising viewed by young children on the lol, sampling from times and channels with highest viewership among young children. Food and drink advertisements were nutrient profiled; allocated to food groups and marketing techniques were identified.

Findings indicate that young children in the RoI are likely to view over 1000 ads for 'less healthy' food/drink items each year (approaching 700 in NI), according to the nutrient profiling system that governs current legislation, UK NP (Department of Health, UK, 2011). However, this study also found that whereas UK NP classified just over half of advertised food items as being less healthy and not suitable for advertising to children, the WHO's nutrient profiling system (WHO, 2015) categorised nearly three-quarters of advertised items as not suitable for advertising to children. Findings also indicate that the 'advertised diet' viewed by young children on television, dominated by dairy foods, burgers, pizzas, sweets and chocolate, represents a considerable distortion of healthy eating guidelines. Finally, findings suggest that persuasive tactics employed in these ads will create positive emotional associations with unhealthy foods among children in Ireland.

On a positive note, the proportion of food and drink advertising on the lol, of television advertising overall, is low (6.6%), and on dedicated children's channels it is negligible (fewer than one ad every two hours on Nickelodeon and Nick Junior). However, general-view commercial channels show food and drink ads approximately every 10–15 minutes, and large numbers of children view such programming – for example the entertainment competition show X Factor (UTV in NI, TV3 in RoI). This echoes UK findings, where HFSS advertisements rose by 230% during non-child programming with high child viewerships (Galbraith-Emami & Lobstein, 2013).

Applying UK NP, the method governing statutory regulation in RoI and NI, just over half of food advertisements (54%) were for items considered 'unhealthy', almost exactly matching Boyland et al.'s (2011) analysis of UK food advertisements. When interpreting this finding, the comparatively lax nature of UK NP should be borne in mind: of eight international nutrient profiling systems, UK NP classifies fewest foods as unhealthy (Scarborough et al.,

2013). Therefore, the proportion of unhealthy foods identified by this study should be considered a minimum. Indeed, when the WHO NP (WHO, 2015) was applied, 72% of ads were identified as not recommended for marketing to children.

The two jurisdictions did not differ significantly in the proportions of advertisements classified as less healthy, suggesting that at the end of 2012, RoI advertisers had already aligned themselves with statutory HFSS regulation, due to be implemented within months. However, there was 50% more food advertising overall in the RoI than in NI, and this translated into greater annual exposure for children in RoI, including for less healthy items. The 'advertised diet' on the IoI, at times of high viewership among young children, was dominated by dairy foods, burgers, pizzas, sweets and chocolate. Almost all staple foods – fruit, vegetables, meat, fish, eggs, bread, potatoes, rice and pasta – were rarely advertised, just 15% of food ads combined. The 'advertised diet' thus represents a pronounced distortion of food groups recommended by nutritionists and the UK Food Safety Authority's Eatwell Plate.

The key persuasive appeals by food ads in this study were taste/aroma, fun, physical ability, magic/fantasy, humour and physical activity. Ads for HFSS foods were significantly more likely than those for healthier items to use taste, novelty and humour as appeals. The US Federal Trade Commission (FTC, 2012) reviewed industry research of brand and ad campaign awareness, appeal and intent to purchase among children. They concluded that uniqueness and humour were the most appealing characteristics to children, who also favoured ads that were fun, exciting/different, had captivating or compelling storylines and featured words such as 'cool' or other language. As novelty and fun appeals were identified particularly in HFSS ads in this study, this indicates that ads for HFSS items in Ireland are likely to be of particular appeal to children.

Overall, therefore, children on the IoI view hundreds, if not thousands of ads annually for 'less healthy' items, and their 'advertised diet' consists primarily of fast food, dairy and sweets. The impact of this repeated viewing can be considered through the lens of cultivation analysis, which complements short-term research in media effects, exploring potential enduring effects due to repetitive, long-term and consistent media exposure (Gerbner, Gross, Morgan, Signorielli, & Shanahan, 2002). It argues that television uses a relatively coherent system of images and messages, to cultivate predispositions, preferences



and a particular perception of reality from infancy onward. Thus, consistent exposure to a distorted food advertising pattern is likely to lead children and parents to form unhealthy normative beliefs about food, its function and meaning, about what constitutes 'children's food' and about taste (Harris et al., 2009). Such beliefs are likely to affect children's food preferences as well as parents' decisions about how to feed children.

Furthermore, emotional links to food in the present study – good taste, fun, humour, physical activity and magic – were repeatedly associated with an unbalanced and largely unhealthy 'advertised diet'. As emotional approaches to advertising are more effective than informational ones (Harris et al., 2009; Nairn & Fine, 2008), if current levels and types of HFSS advertising prevail, children and families on the Iol will continue to build positive associations with unhealthy diets.

### **Limitations and strengths of the study**

The nature of sampling in this study benefited from being systematic and based on young children's most likely viewing practices, but still had limitations. First, the study will have underestimated older children's exposure, as the sampling was based on viewing patterns of children aged 4–6 years, and older children view more programming that is not solely child-directed (Ofcom, 2011). Second, channel and time selections for this study were based on RoI audience panel research as NI-based data were not available. NI children who view primarily BBC channels may have lower exposure to HFSS TV advertising than estimated, as BBC channels do not broadcast advertising. Finally, the study sampled from one time of year (autumn-winter). Some items, for example soups are likely to be seasonal. Although part of the sampling took place prior to Halloween, this appears not to have affected the balance of findings, as no Halloween-related ads were identified, and the proportions of healthy/less healthy ads identified almost exactly match those reported for a full-year ad sample from another UK region (England) to which UK NP was also applied (Boyland et al., 2011).

Overall, a particular strength of the study is that unlike other studies of children's advertising exposure in Ireland and indeed cross Europe (e.g. Jenkin, Wilson & Hermanson, 2008; Keller, & Schulz, 2010; Scully et al., 2015), it did not simply sample from child-directed programming, but developed its sampling frame based on audience panel research that identifies the times and channels most likely to have high viewership among young children. Therefore, the study has been able to estimate children's HFSS ad exposure more accurately

– and to conclude that this remains substantial, despite statutory restrictions on HFSS advertising across the lol.

### **Research implications**

Although research insight into the nature and effects of food marketing on children is considerable, many pressing questions remain. One is children's increasing interactions with digital media. The most popular channels on YouTube are young children's channels, with billions of views monthly (Dredge, 2015), and the YouTube Kids app is the subject of a complaint to the US Federal Trade Commission for advertising content directed at children, including for unhealthy foods, and for violation of food company pledges not to target advertising at children (Ogunkoya, 2015). However, with the advent of personalised behavioural advertising in digital media, although researchers can identify marketing techniques employed, they are no longer able to measure children's exposure, a pressing methodological challenge that remains to be resolved (Tatlow-Golden, 2016).

A second key issue to be addressed is children's differential susceptibility to food marketing. Valkenburg and Peter's model of children's differential susceptibility to media effects proposes that children vary in their consumption and receptivity to media depending on their disposition, development and social surround (Piotrowski & Valkenburg, 2015; Valkenburg & Peter, 2013). For decades, developmental research regarding children's awareness of marketing has tended to focus on middle childhood to the neglect of earlier childhood and adolescence (Harris et al., 2009), has overestimated the role of cognitive factors in resisting advertising and has underestimated the influence of factors such as emotion, motivation, immersion and peer effects (Harris et al., 2009; Rozendaal et al., 2011). Further research is urgently required to understand which sub-groups of children are most vulnerable to food marketing, as personalised behavioural marketing in digital media will target these children in particular, increasing their vulnerability.

### **Policy and practice implications**

There are a number of policy and practice implications of the findings of the present study. First, broadcast regulations in Ireland regarding HFSS advertising should be adapted to take account of children's actual viewing patterns, as children view substantial amounts of family and other television programming. This should include assessments of children's exposure in digital media, where current restrictions on marketing should be extended. Second, regulators should take account of the findings of the present study in light of Scarborough et

al.'s (2013) findings indicating that the UK NP system is the most lenient of international systems surveyed. In addition, given the imbalance in the advertised diet viewed by young children in Ireland, consideration should be given to ways in which staple, healthy foods that are currently represented little – fruit, vegetables, meat, fish, eggs, bread, potatoes, rice and pasta – might be promoted in the media.

Furthermore, the study has implications for parents and educators of young children. Information for parents about the highly skewed advertised diet their young children view on television could support their decisions regarding which channels to view, and may inform public opinion to create support for further regulation. Finally, there is a place for developing pre-school and school-based education about unhealthy foods as well as healthy ones, and about the role of the media in shaping our children's thoughts and feelings about food.

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## Appendix Note 1

The complete set of 113 codes for this study was as follows.

### Food codes (n = 37)

Food, Beverage, Non Food and Beverage, Fast food, Breakfast cereals non high-fibre, breakfast cereals high fibre, Milk, Butter/spreads, Cheese, Yoghurts/fromage frais, Milk based desserts/ puddings, Ice-cream & ice-cream products, Non milk based puddings, Sugar confectionery, Chocolate confectionery, Cakes/pastries/biscuits, Savoury snack foods, Soft drinks carbonated diet, Soft drinks carbonated non diet, Soft drinks non carbonated, Sports Drinks, Other drinks, Fruit juice, fruit drinks, Bottled Water, Bread brown, Bread white, Other breads, Rice/pasta noodles, Fish and fish dishes, Meat and meat products, Crumbed/battered item, Fried potato products, Fruit, Vegetable, Eggs and egg dishes, Other.

### Marketing codes (n = 76)

*Ad features:* Music/jingles, Brand logo stated or sung, Direct audience address, Audio disclaimer, Brand Logo shown, Packaging shown, Disclaimer on screen, Other foods shown, Story format, Informational format.

*Ad settings:* Home – kitchen/dining, Home-living, Home-garden, Park/countryside, Work, School, Street, Fast food restaurant, Shop/retail, Fantasy, None.

*Ad characters:* Real, Animated, Human, Animal, Female, Child, Teen, Young adult, Adult, Friends/peers, Parent/child, Promotional characters, Celebrities, Other.

*Persuasive and informational appeals:* Fun (including play, enjoyment), Humour, Magic/fantasy/imagination, Physical/athletic activity, Gives energy, Achievement, Triumph/hero, Feeling better about self, Feeling inferior, Independence/grown-up, Friendship, Cool, Anti- adult, Child getting the better of adult(s), Appearance/attractiveness, Romance/sexuality, Mood enhancing when in normal mood/state, Emotional eating, Craving/dependency, Exaggerated pleasure sensation, Mocking, Anger/aggression/fighting, Nagging, Trickery, Parent hopes/fears re child, Happy family (or happy parent/child), Parent pleasing, Violence. Taste/aroma, Food fast/easy to obtain, Economy/good value, Satisfies hunger/thirst, Special quality, Novelty/innovative, Premium/offer/contest, Nutrition/health claim, Suggests food can substitute for fruit/veg, Encourages children to ask adult to buy product, Other.